INSTRUCTION MANUAL

DC-5RA

RAMKO RESEARCH
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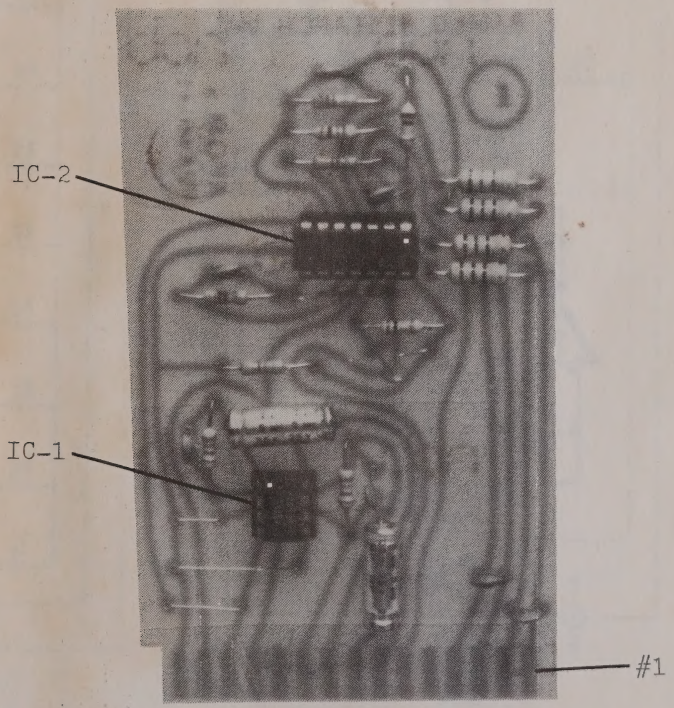
Rancho Cordova, Calif. 95670
(916) 635-3600

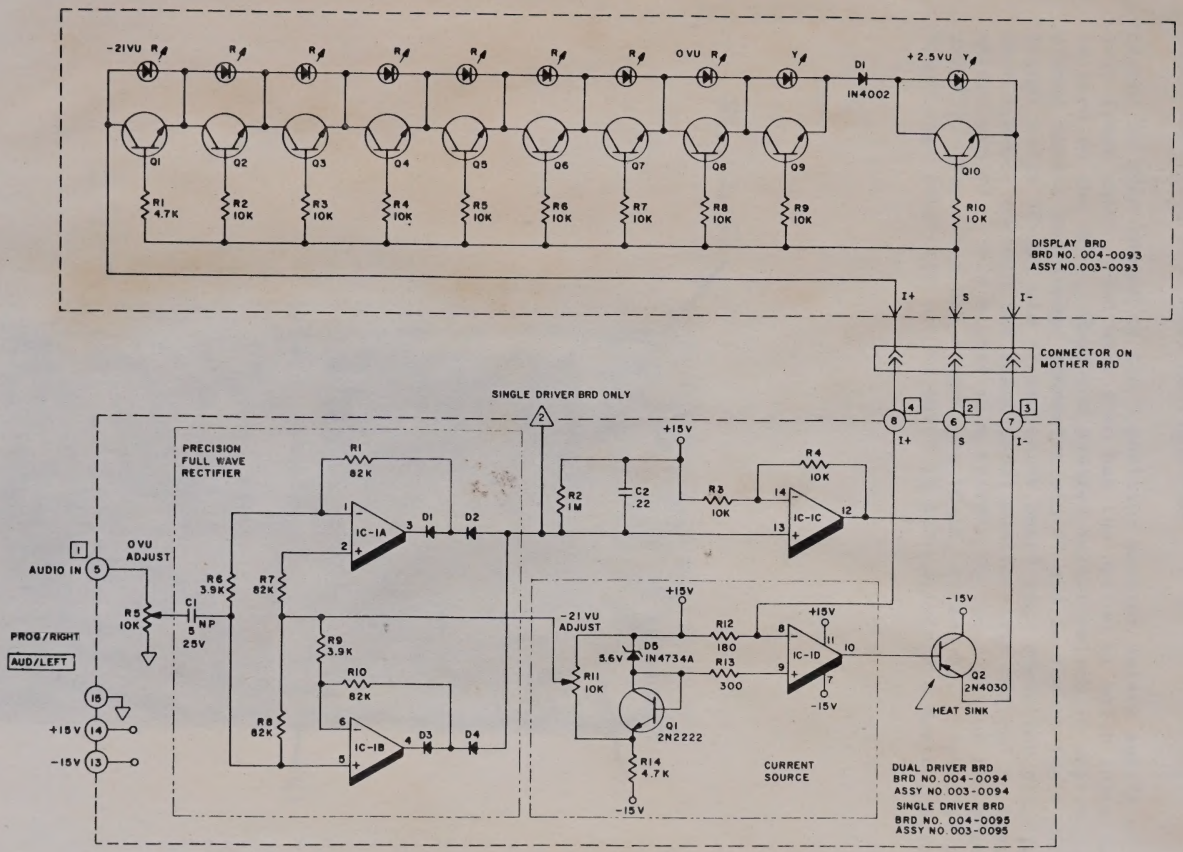
FEB 24 1981

APOM (003-0142)
DUAL OUTPUT AMPLIFIER

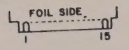
When output select switch "A" is depressed, signal enters card edge connector pin #10 and then to input pin #6, IC-1A. Signal exits pin #7, IC-1A, through C1 and is fed to card edge connector pin #8, travels through the "A" master fader on the front panel and back to the APOM card edge connector pin #6.

At R2, the signal is branched off and fed to input pin #6, IC-2B and also input pin #2, IC-2A. The signal then exits IC-2B, pin #4; IC-2A, pin #3; and travels through the 120 ohm impedance matching resistors to board edge connectors, pins #3 and #4 ("A"out). Since IC-2B is an inverting output, and IC-2A is noninverting. This provides a solid state balanced output. Signal then travels to the barrier strip connectors, pins #22 and #23. The solid state VU meters derive their signal from the plus output of the APOM card.





8. ONLY ONE CHANNEL OF DRIVER & DISPLAY SHOWN SECOND CHANNEL DRIVER CONNECTIONS DESIGNATED BY BOXED NUMBERS
7. TRANSISTORS ARE 2N2222
6. YELLOW LEDS ARE XC556Y OR MV5353
5. RED LEDS ARE XC556R OR MV5054-1
4. DIODES ARE IN914 OR IN4148
3. IC-1 IS RC4136
2. CAPACITORS ARE IN MICRO FARADS 50V OR GREATER
1. RESISTOR ARE IN OHMS 1/4W ±5% ON DISPLAY, 1/2W ±5% ON DRIVER UNLESS OTHERWISE SPECIFIED



SSM-2E/SSM-1

SOLID STATE METER
(DISPLAY & DRIVER)

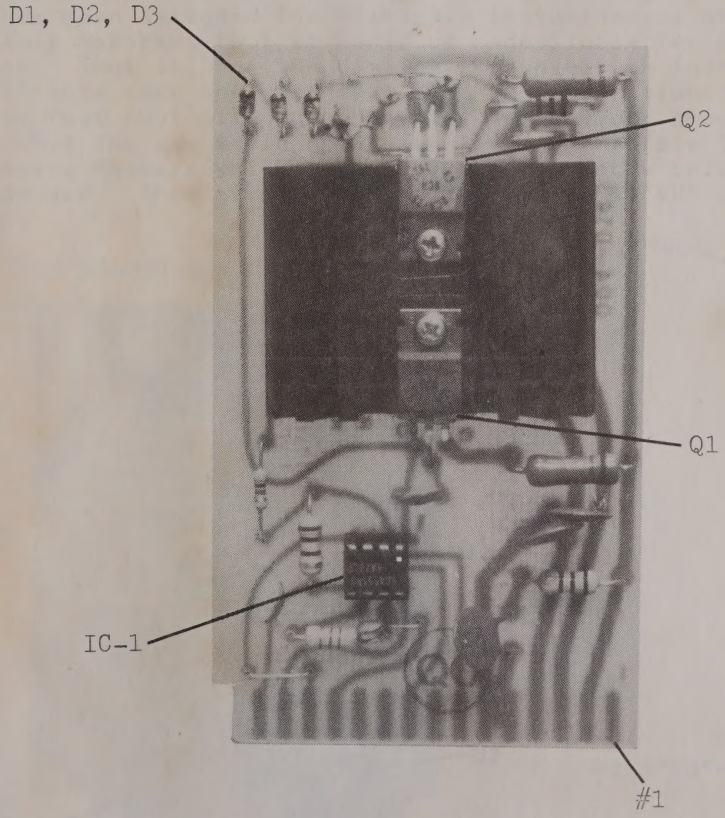
SCH NO. 999-0008-02

DRAWN BY F. WILCOX

MA-1 (003-0143)
MONITOR AMPLIFIER

The MA-1 receives its input signal from any one of five selected inputs. Monitor inputs 1 through 5 are connected to the console barrier strip at connectors #24, #25, #26, #27, and #28.

Signal is then routed to the 5 position monitor select switch on the console front panel. The user then has the option of which input he desires to feed to the MA-1. When the desired select switch is depressed, audio signal enters board edge connector pin #9 and is fed to input pin #6, IC-1B. Signal exits IC-1B, pin #7 and exits board edge connector pin #12. Signal then travels through the front panel monitor gain control to board edge connector pin #7. This signal then travels to the input of the power amp (IC-1A, pin #3). The power amp stages are IC-1A, Q1 and Q2. Signal is then fed to board edge connector pin #2 which in turn drives the monitor speaker.

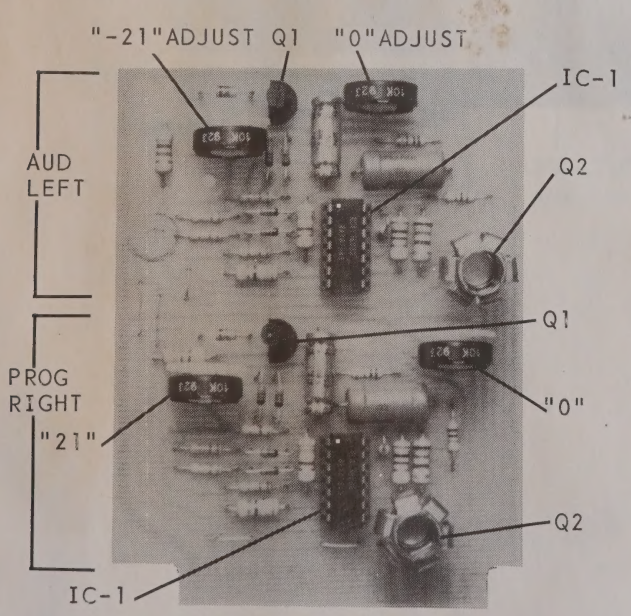


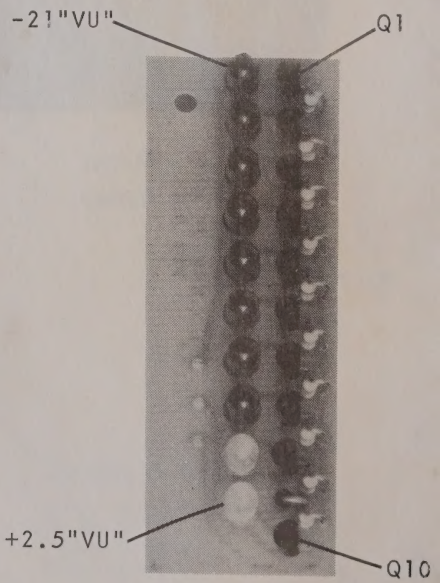
SSM-2E - SOLID STATE METER (003-0094)

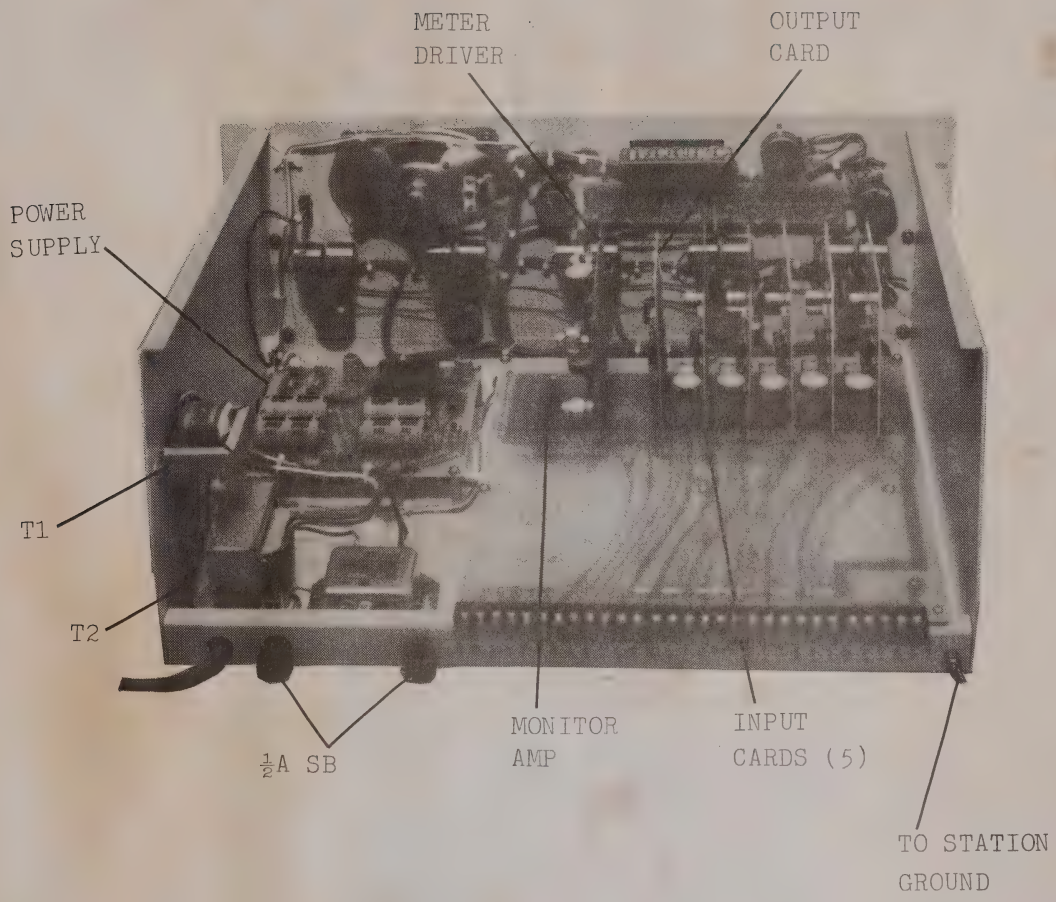
The SSM-2 consists of two seperate modules. The dual meter driver (plug in module) and the dual display board mounted on the front panel.

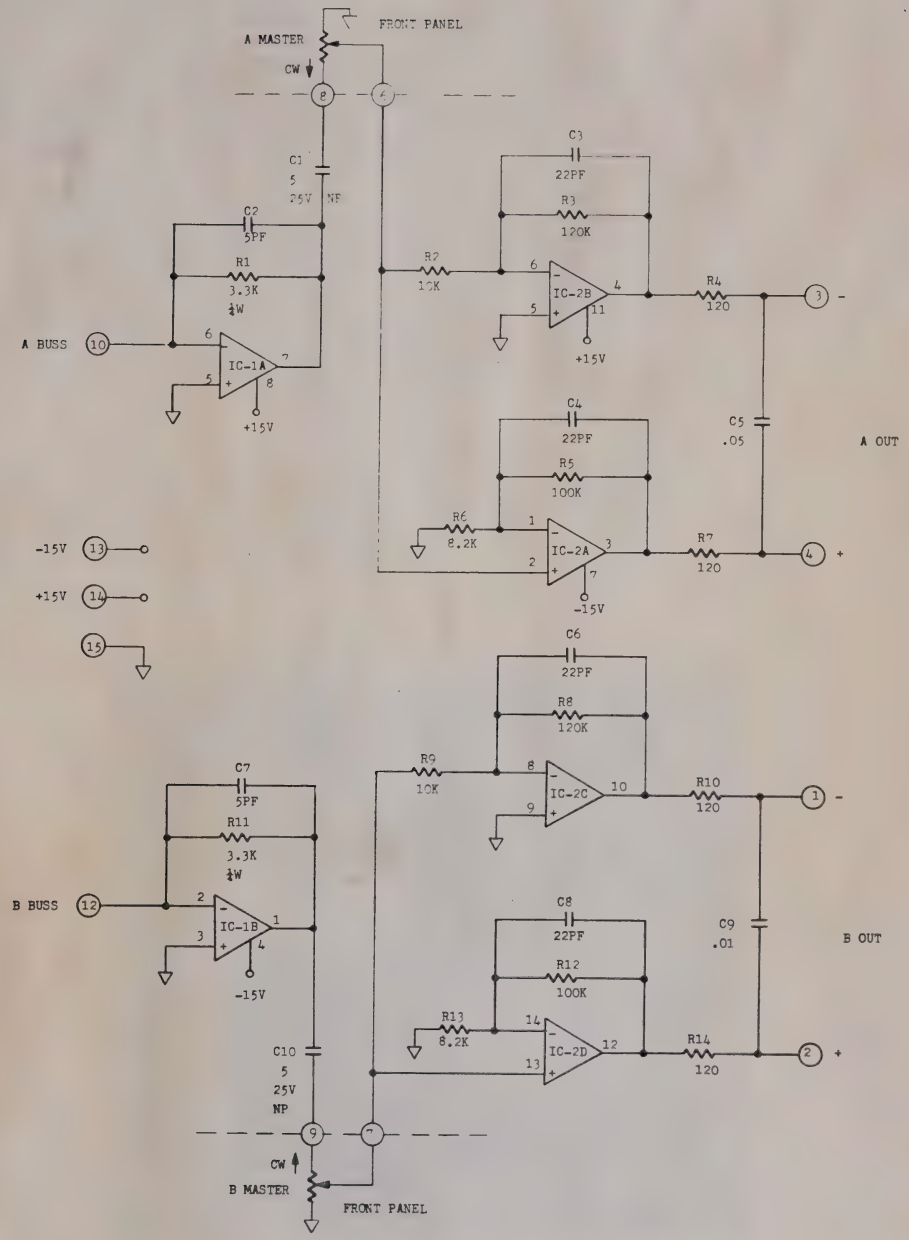
The solid state meter consists of 6 different functional circuits. (1) The precision full wave rectifier (IC-1A & IC-1B); (2) the display delay network (1 meg & .22uf) which affords fast attack and slow decay; (3) the temperature compensated voltage reference (2N3565 & 5.6V zener); (4) the constant current generator (IC-1D)/ (5) the transistor switches (IC-1C)/ (6) the display itself (10 transistors and 10 LEDS).

The first thing to remember is that in the no signal state all display LEDS are shorted out by the parallel transistors. These transistors are all conducting until a signal comes along and one by one are turned off. When the transistors turn off, this short is essentially removed thus allowing the LEDS to light. The second thing to keep in mind is the constant current generator IC-1D and the + & - inputs of the IC are connected across the 5.6V zener, the current thru the LEDS and transistors will always be the same. Thus the display intensity will remain constant regardless of whether only 1 LED is on or all are on. Let's now go back and trace a signal thru. IC-1B and IC-1A comprise the negative going full wave rectifier. This rectifier converts the audio signal into negative pulses which in turn drive IC-1C. This non inverting amp in turn has a negative going output that sequentially turns off the bases of the display transistors. Although this sequence of events has been designed for virtually instantaneous attack time it is immediately apparent that it would be undesirable for it to work the other way. That is, for the display to exhibit an instantaneous release time. If this were the case, you find that many transients would come and go so fast that although the meter would track them they would be so fast that the eye would never see them. Therefore the 1 meg & .22uf cap charging network which gives the meter a decay period of about 1/3 of one second. Thus zippity-zap on the way up & "VU" balistics on the way back.






METER DRIVER
OUTPUT CARD
POWER SUPPLY
T1
T2
½A SB
MONITOR AMP
INPUT CARDS (5)
TO STATION GROUND



4. IC-2 IS RC4136 OR TL-075CN.
3. IC-1 IS RC4558 OR UA4558.
2. CAPACITORS ARE IN MICROFARADS, 50V OR GREATER.
1. RESISTORS ARE IN OHMS, 5% 8.2K OR GREATER ¼W, LESS THAN 8.2K ¼W. UNLESS OTHERWISE SPECIFIED.

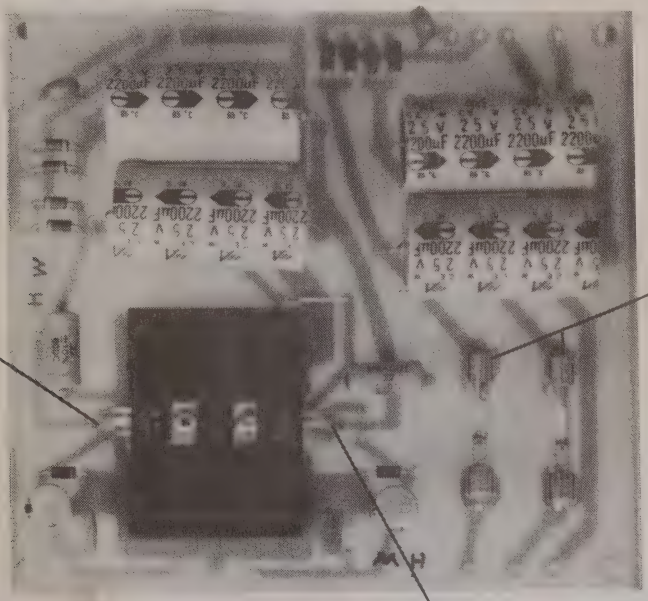
APOM(003-0142)

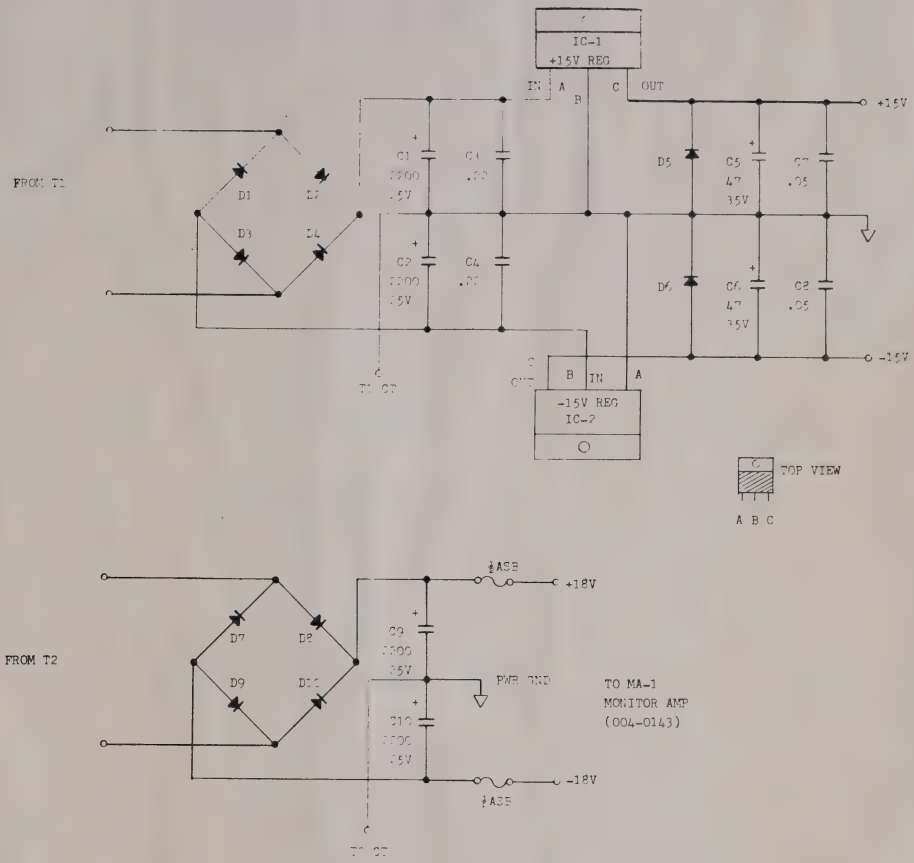
DUAL OUTPUT AMP MODULE
SCH NO. 999-0078
DRAWN BY F. WILCOX
BRD NO. 004-0142

CMPS (003-0140)
CONSOLE & MONITOR POWER SUPPLY

The CMPS is a dual regulated ±15 VDC and ±18 unregulated supply. The CMPS receives it's power from T1, is full wave rectified and then filtered by C1, C2, C3, and C4. The +22V across C1 is fed to IC-1 which provides a highly regulated +15 VDC. IC-2 accomplishes the same thing but is -15 VDC regulator. All capacitors with the exception of C1, C2, C3, and C4 are for power supply stability. Without these caps, the supply would tend to oscillate. D5 and D6 are protection diodes, and are designed to keep any of the supply voltages from momentarily reversing below ground and damaging the console electronics. RV1 across the rectifiers input is a metal oxide varistor and is an AC line transient protective device. Any spikes or steady voltages above 36 VAC are instantaneously shorted out. IC-1 and IC-2 are both over current and temperature protected and automatically shut down if either event occurs.

The unregulated ± VDC receives its power form T2, is full wave rectified and then filtered by C9 and C10. Both the + and - voltages are fused to protect the monitor amp from excessive voltages. This supply is used for the monitor amp.





4. IC-2 IS NEGATIVE VOLT REGULATOR UA7915-CKC OR LM320T-15.
3. IC-1 IS POSITIVE VOLT REGULATOR UA7815-CKC OR LM340T-15.
2. DIODES ARE 1N4002.
1. CAPACITORS ARE IN MICROFARADS, 50V OR GREATER.
UNLESS OTHERWISE SPECIFIED:

CMPS(003-0140)

CONSOLE MONITOR PWR SUPPLY
SCH NO. 999-0080
DRAWN BY F. WILCOX
BRD NO. 004-0140

DC-5RA Specifications

INPUT LEVEL:	-60dBm (.8m)	510 ohms
	0 dBm (.776v)	560 kilohms
	0 dBm out	
	Mixer 12:00	
	Master 12:00	
HEADROOM:	20 dB	
	S/N: Line -70dB 0dBm in 0dBm out 73.5 with cover on	
RESPONSE:	Line 20Hz-20kHz +0 -1 dB	
	Mic 20Hz-15kHz +0 -2 dB	
DISTORTION:	0 dBm out 20Hz-20kHz .1%	
	+10 dBm out 20Hz-20kHz .2%	

EXAMPLE GAIN SELECT SHEET

All Ramko consoles have the distinct advantage of full range gain select on their inputs. Thus unlike other consoles you are not tied to just HIGH/LO select but can adjust the gain of the inputs for any source level (-60dbm thru +10dbm nominal).

Refering to your input board schematic you will note the audio inputs go thru a small patch panel of resistors. There are two resistors for each input. One each for the plus and minus legs of each balanced pair. Whenever an input's gain is changed both resistors of this input must be changed. (3)

SOURCE LEVEL (Nominal)	CHANNEL INPUT RESISTOR (1)	AIR INPUT
-60 dbm	510 ohm	-50 dbm
-55 dbm	1 K	-45 dbm
-50 dbm	1.8 K	-40 dbm
-45 dbm	3.3 K	-35 dbm
-40 dbm	5.6 K	-30 dbm
-35 dbm	10 K	-25 dbm
-30 dbm	18 K	-20 dbm
-25 dbm	33 K	-15 dbm
-20 dbm	47 K	-10 dbm
-15 dbm	100 K	-5 dbm
-10 dbm	150 K	0 dbm
0 dbm	560 K	
+10 dbm	1.5 meg (2)	

(1) All resistors should be ¼ watt. Resistors used in low level applications should be carbon or metal film low noise types.

(2) Not recommended due to possible hum pickup. Suggest external signal pad down for these levels.

(3) CMR may need adjustment when input resistors are changed.

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-40 dbm	5.6 K	-30 dbm
-35 dbm	10 K	-25 dbm
-30 dbm	18 K	-20 dbm
-25 dbm	33 K	-15 dbm
-20 dbm	47 K	-10 dbm
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0 dbm	560 K	
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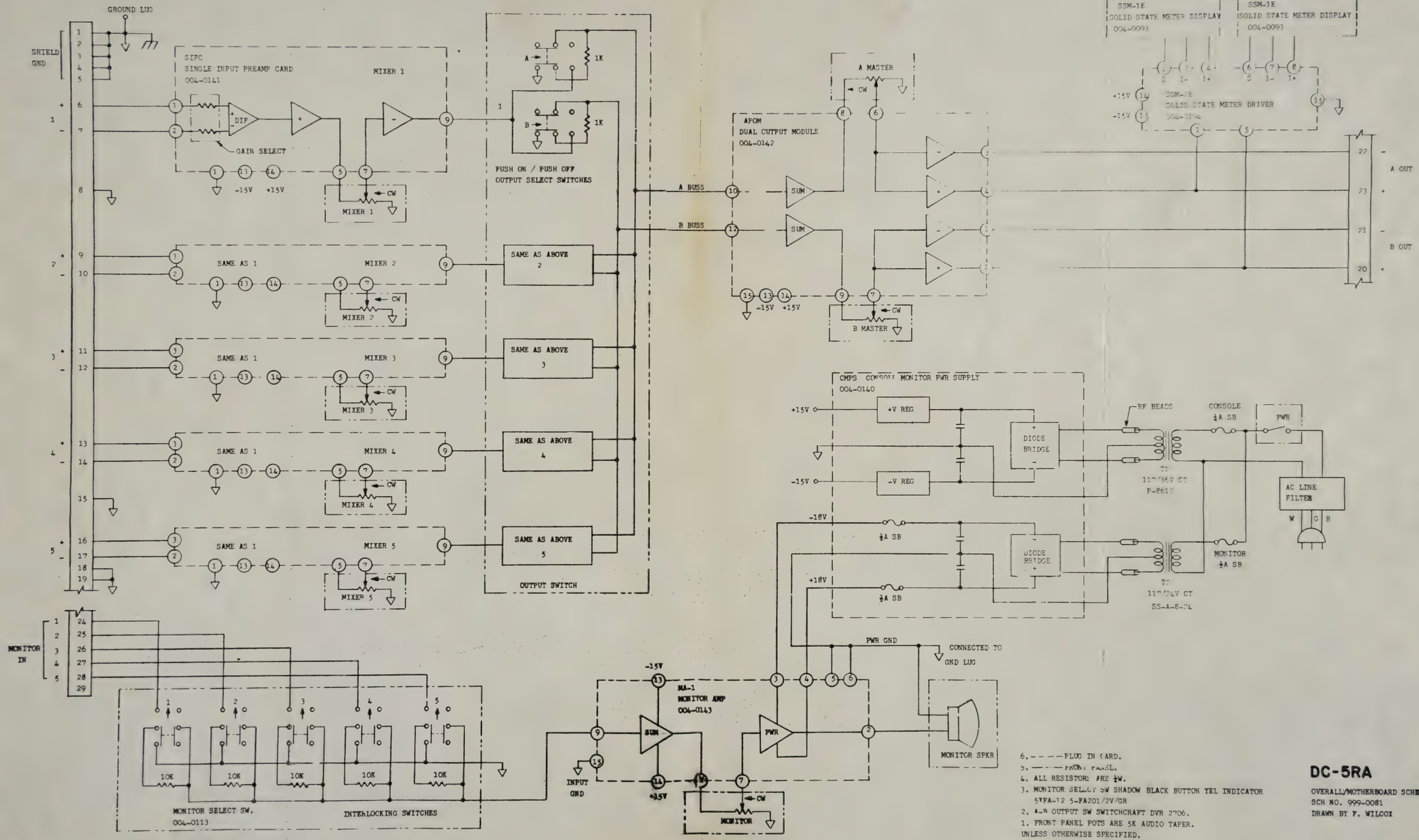


6. - - - - PLUG IN CARD.
5. ——— FRONT PANEL.
4. ALL RESISTORS ARE ¼W.
3. MONITOR SELECT SW SHADOW BLACK BUTTON YEL INDICATOR
   5PFA-12 5-FA201/2V/GR
2. A-B OUTPUT SW SWITCHCRAFT DVR 2706.
1. FRONT PANEL POTS ARE 5K AUDIO TAPER.
UNLESS OTHERWISE SPECIFIED.

DC-5RA

OVERALL/MOTHERBOARD SCHEMATIC
SCH NO. 999-0081
DRAWN BY F. WILCOX

INSTALLATION

GENERAL

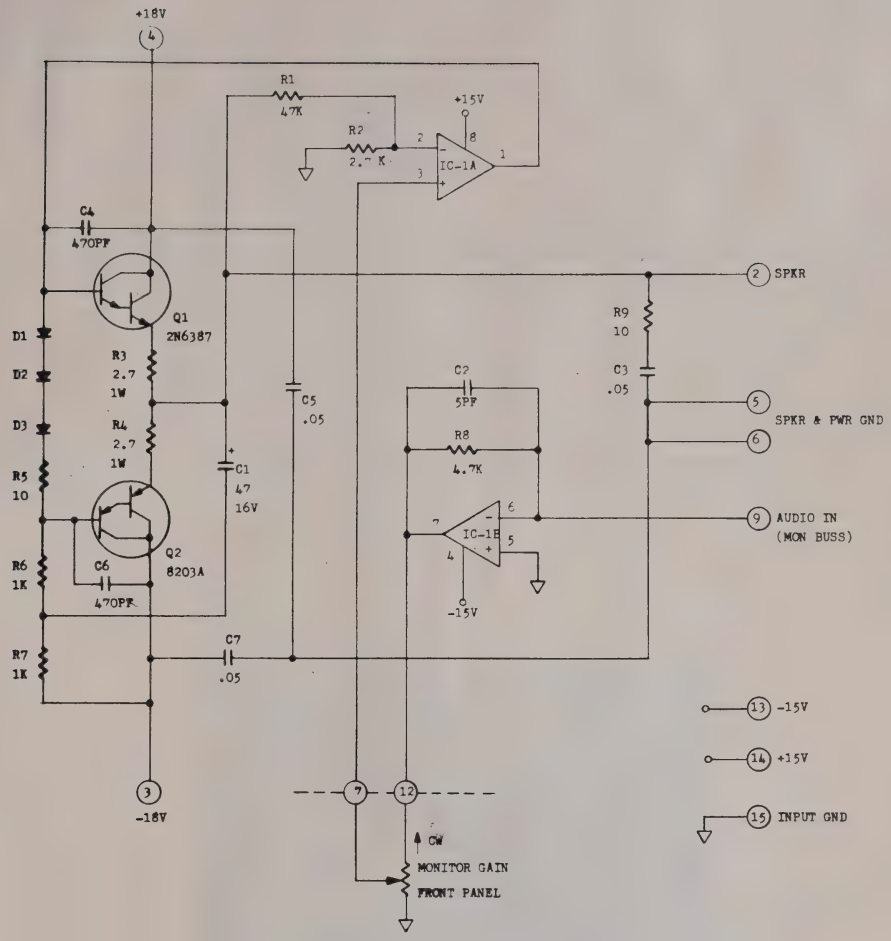
WE RECOMMEND THAT YOU THROUGHLY FAMILIARIZE YOURSELF WITH THE CONSOLE BEFORE PROCEEDING WITH THE INSTALLATION.

By following the good engineering practices in this manual, stable and reliable operation will be insured.

A 2 ground system has been utilized in this new series of consoles to insure RF and hum free operation. The safety ground wire in the AC cord is also connected to an AC filter in the console which protects the console from both AC transients and RF. The second ground appears at the rear of the console (wing nut and stud). Only at this point are the audio and chassis grounds tied together. An insulated ground strap (10 gauge stranded wire or copper braid) must be run from this point directly to your studio or station ground. The shorter the better.

All grounds on shielded cable entering the console from external sources (mics. record/playback units, TT preamps, etc.) should be connected to the barrier strip gound associated with that input. This is the only point that the shield ground should be connected and not at the source end. Connection in any other manner may cause RF and or hum problems. Caution should be exercised when the console inputs are being fed by a jack field. Jack "normals" should be wired with sleeve-to-sleeve jumpering which does not interconnect with the rack gound in which the jack strips are mounted.

Insulated, "Jacketed", shield pair cable is strongly recommended for all external source hookups, including jack strip wiring, to reduce the possibility of accidental grounding of the cable shield.



4. IC-1 IS RC4558 OR UA4558.
3. DIODES ARE 1N4002.
2. CAPACITORS ARE IN MICROFARADS, 50V OR GREATER.
1. RESISTORS ARE IN OHMS 5% 8.2K OR GREATER ¼W, LESS THAN 8.2K ¼W.
   UNLESS OTHERWISE SPECIFIED:

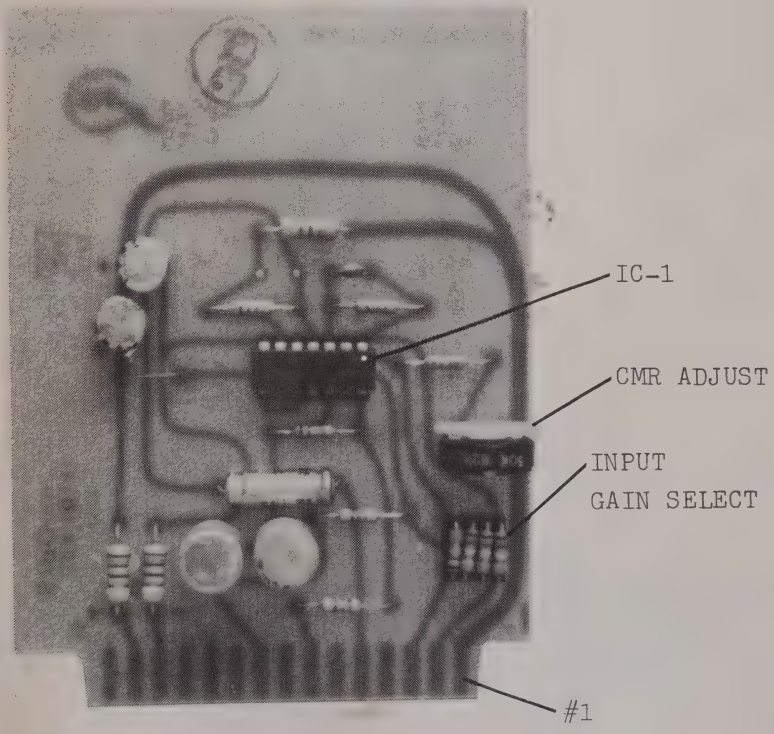
MA-1 (003-0143)

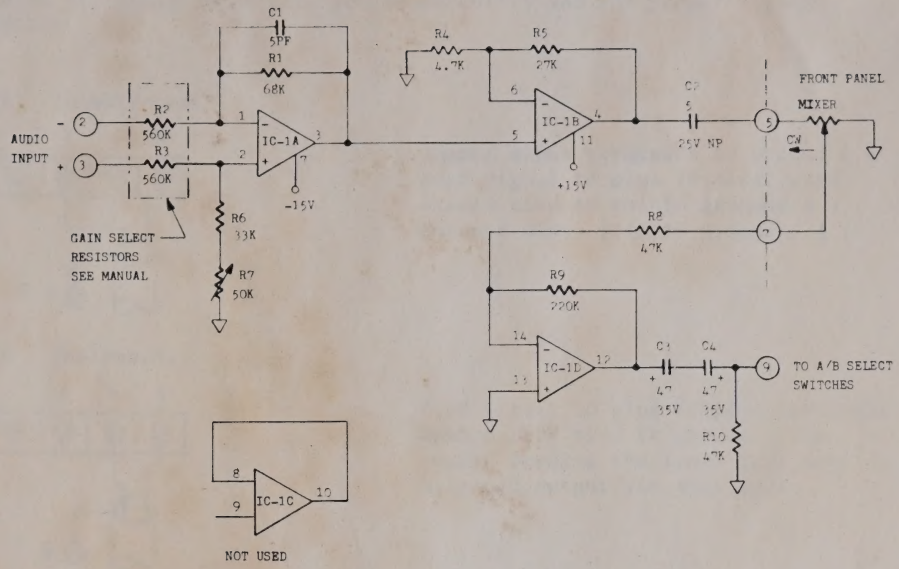
MONITOR AMP
SCH. NO. 999-0077
DRAWN BY F. WILCOX
BRD NO. 004-0143

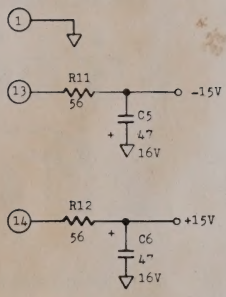
SIPC (003-0141)
SINGLE INPUT PREAMP CARD

This card features balanced inputs with selectable gain. This is accomplished via plug-in resistors.
Line levels are factory set at 0 dBm.
Line levels are factory set at -6 dBm.

Audio signal enters from the barrier strip connectors and is fed to card edge connector pins #2 and #3. Signal then passes through the gain select resistors, (R2 and R3) and enters IC-1A (Differential Balanced Input), pins #1 and #2. Signal exits IC-1A, pin #3, enters pin #5, IC-1B, then exits IC-1B, pin #4, and is fed through C2 to card edge connector, pin #5. This signal is then fed to the front panel gain control and fed back to card edge connector pin #7. The signal then flows through R8 to input pin #14, IC-1D. Signal exits IC-1D, pin #12, passes through C3 and C4 to card edge connector pin #9. It is then routed to the front panel A/B select switches and is then routed back to the mother board and fed to either "A" buss or "B" buss, depending on which switch is selected. Signal is then routed to APOM card.







3. IC-1 RC4136 OR TL-075CN.
2. CAPACITORS ARE IN MICROFARADS 50V OR GREATER.
1. RESISTORS ARE IN OHMS 5%, 8.2K OR GREATER ¼W, LESS THAN 8.2K ¼W.
UNLESS OTHERWISE SPECIFIED:

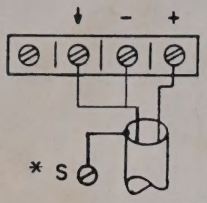
SIPC (003-0141)

SINGLE INPUT PREAMP CARD
SCH NO. 999-0079
DRAWN BY F. WILCOX
BRD NO. 004-0141

BALANCED AND UNBALANCED METHODS OF CONNECTING INPUTS AND OUTPUTS

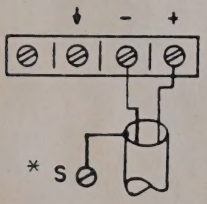
Both the inputs and outputs, when shown with both + and -, may be used in either the balanced or unbalanced configuration. CAUTION: It is important that the following procedures be followed to prevent possible damage to the equipment's intergrated circuitry and for proper signal processing.

INPUTS (unbalanced)



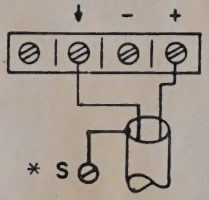
Jumper minus terminals to ground (⏚). Feed signal to plus terminal with shield tied to shield ground(S). Connect minus wire to ground (⏚).

INPUTS (balanced)



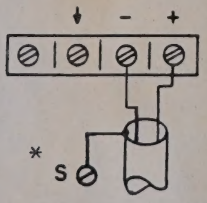
Feed signal to plus & minus terminals with shield tied to ground. The source feeding the input must have balanced output for this mode.

OUTPUTS (unbalanced)



Audio output is taken from the plus terminal with shield tied to shield ground (S). THE MINUS TERMINAL IS LEFT FLOATING FREE. DO NOT CONNECT THIS TERMINAL TO GROUND. Minus wire is connected to ground (⏚).

OUTPUTS (balanced)



Audio output is taken from the plus and minus terminals with the shield tied to ground. FEED ONLY EQUIPMENT WITH BALANCED INPUTS IN THIS MODE.

Note: All shield wires should be as short as practical. Shield wire should be split out, and foil shielding should continue on to barrier strip.

* Some units have a wing nut on rear of chassis for shield/gnd.